



# Metastatic non-Hodgkin lymphoma presenting as low back pain and radiculopathy: a case report

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## Abstract

**Objective:** The purpose of this case report is to describe a case of metastatic non-Hodgkin lymphoma in the lumbar spine presenting as lumbar radiculopathy.

**Clinical Features:** A 46-year-old man sought care from his doctor of chiropractic for low back pain and right leg radiculopathy. The patient was referred for a magnetic resonance imaging (MRI) scan to evaluate for a suspected disk herniation. The MRI scan revealed 2 lumbar pathologic compression fractures with cauda equina compression, and MRI short tau inversion recovery (STIR) sagittal image of the lumbar spine showed high signal in T12 and S2.

**Intervention and Outcome:** The patient was referred for an immediate consultation with his medical physician with the preliminary diagnosis of metastatic bone lesions or primary bone lesions of unknown etiology. The patient underwent bone biopsy, computed tomography, and positron emission tomography scanning and was diagnosed with small cell non-Hodgkin lymphoma with osseous metastasis. The patient underwent chemo- and radiation therapy, and the lymphoma is now in remission 18 months later.

**Conclusion:** This case describes the presentation of metastatic non-Hodgkin lymphoma as a possible contributing cause in a patient presenting with lumbar radiculopathy, a common musculoskeletal condition. As well, this case highlights the importance of STIR sequences as part of a routine lumbar spine MRI examination. Without the STIR sequences, the additional deposits in T12 and S1 would not have been readily appreciated. Although metastatic non-Hodgkin lymphoma of the spine is rare, it should be remembered in the differential diagnoses.

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## Introduction

Low back pain (LBP) with concurrent radiculopathy in an otherwise healthy mid-40-year-old patient is usually associated with lumbar disk herniation. Radiculopathy and back pain as first signs of non-Hodgkin lymphoma (NHL) spinal metastasis is rare, occurring in less than 5% of patients.<sup>1,2</sup> Although NHL metastasis to the spine is rare as an initial manifestation of malignancy, it should be considered in cases of spinal cord compression thought to be due to malignant disease. The purpose of this case report is to describe the presentation and diagnostic imaging of a patient with symptoms of LBP and lumbar radiculopathy and metastatic NHL.

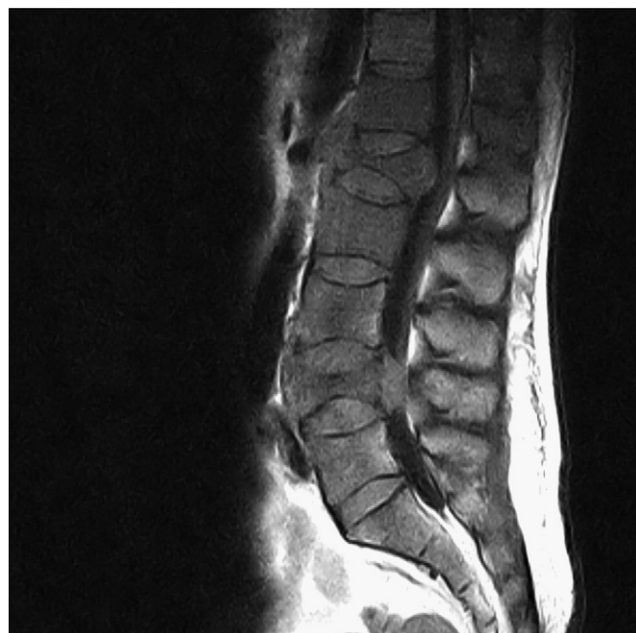
## Case report

A 46-year-old man was seeking chiropractic care for LBP on the right side, which radiated down to the midthigh and sometimes into the lower leg. No numbness, tingling, cramping, or burning sensations were reported. The pain had been present for 2 weeks and was getting worse. He reported that he was very stiff in the morning for about 10 to 15 minutes until he began moving. The pain was achy all day and scored as 6 to 7 of 10 on a numeric pain scale. The pain was aggravated by lifting heavy objects at work and transitioning from sitting to standing. The patient gave consent to have his personal health information published without divulging personal identifiers.

Orthopedic and chiropractic examination procedures revealed restricted intersegmental motion with pain from L4 to S1 on all movements with a pain level of 6 to 7 of 10. Results of Straight Leg Raise, Braggard, Kemp, and Patrick FABERE tests were positive for LBP at a pain level of 7 to 8 of 10 with radiation to the right leg down to midthigh. Result of Valsalva test was positive with a pain level of 6 to 7 of 10. Results of muscle, sensory, and reflex testing were all normal. The patient reported that he was otherwise in good health. His vital signs were within normal limits; and there were no signs or history of weight loss, wasting, or other chronic, systemic disorder. The initial working diagnosis was sciatica with strain/sprain and muscle spasm. He was treated with chiropractic care consisting of spinal manipulation to improve spinal motion and reduce pain intermittently over 4 months. By the end of the 4-month period, the patient reported that the LBP was 2 of 10.

During the fifth month, the patient presented with LBP that radiated into his right leg; but this time, the pain was of a higher intensity. He stated that this pain came on suddenly while straining during a bowel movement. His pain was worse in the morning (8/10) and remained achy all day. The pain interfered with his work, which required lifting heavy objects. The LBP was constant with no reported relieving factors. The leg pain was relieved by rest and lying down. No sphincter or bladder disturbances were reported. A reexamination found positive results in the Straight Leg Raise test, Well Leg Raise test, Braggard test, and Kemp test, all with radicular pain down the right leg. Result of Valsalva test was positive. Deep tendon reflexes were equal bilaterally. No muscle weakness was evident. An area of numbness was noted over the left and right hips, corresponding to the L1-L2 dermatomes. A working diagnosis of disk herniation was made, and the patient was referred for a magnetic resonance imaging (MRI) scan of the lumbar spine.

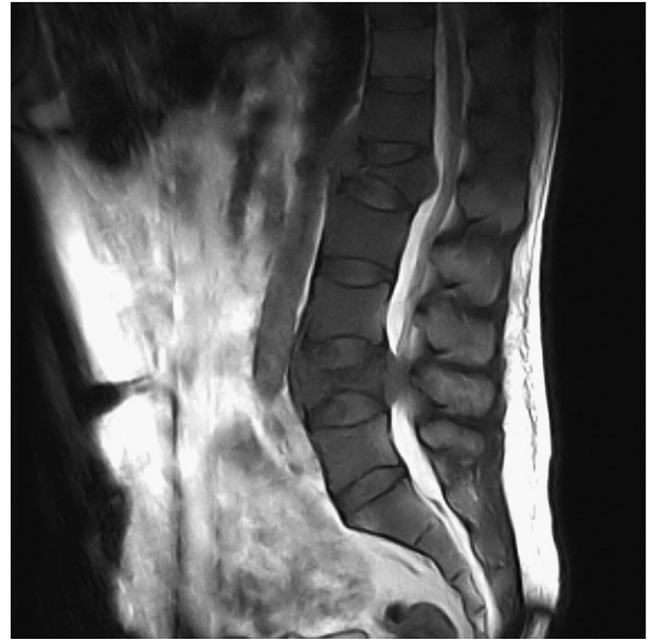
Magnetic resonance imaging findings revealed thecal sac and cauda equina compression at the L1 and L4 levels due to destruction and collapse of the L1 and L4 vertebrae with posterior extension of a soft tissue mass (Figs 1 and 2). There was destruction of the L1 and L4 anterior vertebral cortices with anterior



**Fig 1.** Magnetic resonance imaging T1 sagittal image of the lumbar spine. The image shows compression of the middle and anterior L1 and L4 vertebral bodies with both anterior and posterior extension of mass, which is isointense relative to marrow.



**Fig 2.** Magnetic resonance imaging T2 sagittal image of the lumbar spine displaying the same pathological compression fractures that are isointense and slightly hyperintense relative to bone marrow. Faint high signal is seen in the T12 vertebral body and S2, raising the suspicion of additional lesions.



**Fig 3.** Magnetic resonance imaging completely balanced steady-state sagittal image of the lumbar spine confirms the lesions to be isointense relative to bone marrow. The posterior mass lesions are clearly seen extending into the cerebrospinal fluid and compressing the cauda equina.

extension of a soft tissue mass (Fig 3). In addition, suspicious high-signal lesions were noted in T12 and S2 on the short tau inversion recovery (STIR) sequence (Fig 4), which was not readily appreciated on the T2-weighted image (Fig 2). The differential diagnoses included spinal metastasis of unknown origin, primary or metastatic lymphoma, multiple myeloma, tuberculosis/Pott disease, infection, and epidural abscess.

The patient was referred for an immediate consultation with his medical physician with the preliminary diagnosis of metastatic bone lesions or primary bone lesions of unknown etiology. The patient underwent bone biopsy, computed tomography, and positron emission tomography scanning. The biopsy revealed small cell NHL. Computed tomography and positron emission tomography scanning showed metastasis in the lung and liver. Chemotherapy and radiation were administered for 4 days followed by chemotherapy for 6 months. The patient has been in remission for 18 months.

## Discussion

Spinal metastasis as the initial manifestation of NHL is rare and is thought to occur in less than 5% of cases.<sup>1,2</sup> Spinal metastasis and epidural metastasis are infrequently encountered in patients with established

NHL as well.<sup>3,4</sup> Spinal cord/cauda equina compression from NHL is usually due to an isolated primary or secondary deposit within the spinal canal<sup>5</sup> or by extension from an adjacent nodal mass or collapsed vertebra.<sup>2</sup>



**Fig 4.** Magnetic resonance imaging STIR sagittal image of the lumbar spine confirms the high signal in T12 and S2.

Most neoplasms presenting with spinal epidural metastasis as initial manifestation of malignancy are carcinomas of the lung, multiple myeloma, NHL, and carcinoma of unknown primary site.<sup>6</sup> Cauda equina or cord compression due to secondary malignant epidural spinal extension is commonly encountered in up to 70% or more of patients already diagnosed with cancer.<sup>7,8</sup> Spinal metastasis with epidural extension typically occurs in the later disease stages.<sup>9,10</sup>

The spine is the third most common site for cancer cells to metastasize, following the lung and the liver. The vertebral column is the most common site of skeletal metastases.<sup>11</sup> Cancers of the breast, lung, and prostate account for 60% of all metastases to bone.<sup>12</sup>

Non-Hodgkin lymphoma is a group of blood cancers, and it is the seventh most common cancer in the United States.<sup>13</sup>

There are about 30 subtypes that range in severity from aggressive to mild. Signs and symptoms usually include swollen lymph nodes in the neck, groin, or axillary regions; fever; fatigue; weight loss; abdominal pain; cough; and/or shortness of breath. These are often nonspecific symptoms, but should prompt further diagnostic workup. The patient in this case demonstrated no constitutional symptoms, which is the norm rather than the exception.<sup>6</sup>

The cause of NHL is unknown, but certain risk factors have been identified. The most common types of NHL usually appear in people in their 60s and 70s. Men are affected more than women. In the United States, white people are more likely to develop NHL than African Americans and Asian Americans. A history of viral or bacterial infections such as Epstein-Barr virus or human immunodeficiency virus may play a role in some lymphomas. Immune system deficiency disorders, autoimmune disorders, exposure to industrial and agricultural chemicals, and radiation treatment have also been linked to NHL.<sup>14</sup> Our patient exhibited none of these risk factors other than being a white man. As demonstrated by this case, it is imperative that the treating practitioner performs a thorough neurological examination and promptly refers for advanced imaging when indicated.

A prodromal phase of local back pain persisting up to a year followed by a second phase of rapidly progressive signs of nerve compression has been described in NHL presenting with spinal epidural involvement.<sup>15</sup> This was the case with our patient; however, the same clinical presentation/scenario may also be encountered commonly with disk herniation.

The most common presenting symptom of NHL is a painless swelling of the lymph nodes in the neck,

underarm, or groin; however, owing to its insidious nature, symptomatic lymphoma, primary or secondary, may present as seemingly uncomplicated musculoskeletal complaints in chiropractic offices. Cases presenting to chiropractic offices that have been reported in the literature include LBP with radiculopathy,<sup>16</sup> shoulder strain, rotator cuff tendinitis,<sup>17</sup> posttraumatic sprain/strain of the hip,<sup>18</sup> chronic piriformis myofascial pain syndrome with sacroiliac joint dysfunction,<sup>19</sup> thoracic spine pain,<sup>20</sup> and "biomechanical" neck pain,<sup>21</sup> all commonly encountered entities in chiropractic practice. Non-Hodgkin lymphoma has also been reported to mimic thoracolumbar spinal tuberculosis or Pott disease.<sup>22</sup> Primary bone lymphoma is exceedingly rare, accounting for only 3% of all primary bone malignancies.<sup>23</sup> Primary bone lymphoma may also present with LBP and radiculopathy as the initial manifestation of malignancy.<sup>24-26</sup>

This case highlights the importance of STIR sequences as part of a routine lumbar spine MRI examination. Without the STIR sequences, the additional deposits in T12 and S2 would not have been readily appreciated. Short tau inversion recovery imaging is a fat-saturated imaging technique that results in markedly decreased signal intensity from fat and strikingly increased signal from fluid and edema. As a result, STIR is an extremely sensitive tool for detecting most types of soft tissue and marrow pathology. Most musculoskeletal imaging protocols include STIR sequences together with standard T1 and T2 pulse sequences.

## Limitations

This case report represents an unusual presentation; therefore, it cannot be assumed that other patients with metastatic NHL will present or respond to care in a similar manner. Best clinical judgment should be used in consideration of each patient case.

## Conclusion

This case describes the presentation of metastatic NHL as a possible contributing cause in a patient presenting with lumbar radiculopathy, a common musculoskeletal condition. Although metastatic NHL of the spine is rare, it should be remembered in the differential diagnoses. The presented case provides an example of a rare and unique presentation of disease and an early discovery and treatment.



## Funding sources and potential conflicts of interest

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